

## **CLAIMS**

The following claims are currently pending in the application:

1. (Previously Presented) A Taylor reactor comprising a reactor housing,  
a rotor which is disposed in the volume enclosed by the reactor housing and is rotatable about an axis,  
a reaction volume formed between an inner periphery of the reactor housing and an outer periphery of the rotor,  
at least one inlet for the reactants and/or process media and at least one outlet for the reaction products, disposed in the direction of the axis at a distance from the inlet, wherein the reactor housing and/or the rotor are equipped such that the cross section of the reaction volume initially increases at least over part of a length of the rotor in an area adjacent the inlet and the cross section of the reaction volume does not increase at least over part of the length of the rotor in an area adjacent the outlet.
2. (Previously Presented) A Taylor reactor as claimed in claim 1, wherein the rotor is disposed concentrically in the reactor housing.
3. (Previously Presented) A Taylor reactor as claimed in claim 1, wherein the reaction volume is of annular design.
4. (Previously Presented) A Taylor reactor as claimed in claim 3, wherein the reaction volume has a circular periphery.
5. (Previously Presented) A Taylor reactor as claimed in claim 1, wherein the cross section of the reaction volume in the area in which the cross section of the reaction volume does not increase at least over part of the length of the rotor is continuous.
6. (Previously Presented) A Taylor reactor as claimed in claim 1, wherein the cross section of the reaction volume in the area in which the cross section of the reaction volume does not increase at least over part of the length of the rotor is discontinuous.

7. (Previously Presented) A Taylor reactor as claimed in claim 6, wherein at least one of the reactor housing or the rotor have, in the direction of the axis (A), at least two sections whose inner periphery and/or outer periphery form(s) different angles with respect to the axis (A).

8. (Previously Presented) A Taylor reactor as claimed in claim 1, wherein the ratio of the radius of the reactor housing ( $r_o$ ) to the radius of the rotor ( $r_i$ ) at least for part of the length of the reaction volume is  $<1.4$ .

9. (Previously Presented) A Taylor reactor as claimed in claim 1, wherein the rotor is cylindrical.

10. (Previously Presented) A Taylor reactor having a reactor housing, having a rotor which is disposed in the volume enclosed by the reactor housing in such a way as to be rotatable about an axis, having a reaction volume formed between the inner periphery of the reactor housing and the outer periphery of the rotor, having at least one inlet for the reactants and/or process media, in particular as claimed in claim 1, wherein an outlet region which opens out into an outlet is provided which in the reactor housing at one end face of the rotor adjoins the reaction volume and narrows to an outlet and wherein the end face of the rotor is designed such that the reaction volume opens out at least essentially without deadspaces into the outlet.

11. (Previously Presented) A Taylor reactor as claimed in claim 10, wherein the end face of the rotor is designed such that in the direction of the axis (A) the cross section of the outlet region is at least substantially constant.

12. (Previously Presented) A Taylor reactor as claimed in claim 10 or 11, wherein the reactor housing is configured such that the outlet region is in the shape of a funnel and the end face of the rotor is of conical design.

13. (Previously Presented) A Taylor reactor having a reactor housing, having a rotor which is disposed in the volume enclosed by the reactor housing in such a way as to be rotatable about an axis,

having a reaction volume formed between the inner periphery of the reactor housing and the outer periphery of the rotor, having at least one inlet for the reactants and/or process media and having at least one outlet for the reaction products, in particular as claimed in claim 1, wherein the outlet opens out into the reaction volume at a radial distance from the axis.

14. (Previously Presented) A Taylor reactor as claimed in claim 13, wherein the outlet opens out transversely, preferably perpendicularly, to the axis into the reaction volume.

15. (Previously Presented) A Taylor reactor as claimed in claim 13, wherein the region of the rotor that is adjacent to the outlet comprises means for generating a circulation flow around the axis.

16. (Previously Presented) A Taylor reactor as claimed in claim 15, wherein the region of the rotor that is adjacent to the outlet is designed in the manner of a centrifugal pump rotor.

17. (Previously Presented) A process for converting substances, where the kinematic viscosity  $\nu$  of the reaction medium increases in the flow direction of the reactor, which comprises using therefor a Taylor reactor as claimed in claim 1.

18. (Previously Presented) A process as claimed in claim 17 for preparing substances selected from the group consisting of polymers, copolymers, block polymers, graft copolymers, polycondensates, polyadducts, core/shell lattices, polymer dispersions, products of polymer-analogous reaction, including esterification, amidation and urethanization of polymers containing side groups suitable for such reactions, olefinically unsaturated materials curable with electron beams or ultraviolet light, or mesophases.

19. (Previously Presented) A process of making at least one member of the group consisting of moldings, films, coating materials, paints, adhesives, and sealants, comprising using at least one substance prepared by the process of claim 17.

20. (Previously Presented) A Taylor reactor comprising:
- a reactor housing;
  - a rotor having an axis and disposed in the volume enclosed by the reactor housing;
  - a reaction volume formed between an inner periphery of the reactor housing and an outer periphery of the rotor;
- at least one inlet in the housing for at least one of a reactant or a process media and at least one outlet in the housing for the product of the at least one of a reactant or a process media disposed opposite the at least one inlet, wherein the reactor housing in the area of the rotor has a first section and a second section, the first section having a cross section of the reaction volume that increases as the reaction volume extends from the inlet to the outlet, and the second section having a cross section of the reaction volume that increases as the reaction volume extends from the inlet to the outlet to a lesser extent than the increase of the first section.